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## Article

# Market discipline in the Latin American banking system: Testing depositor discipline, borrower discipline, and the internal capital market hypothesis

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## ABSTRACT

This paper tests the existence of market discipline in the Latin American banking system using a variety of methods. It re-examines traditional tests on depositor discipline, controlling banks' internal capital demand. In addition, it explores whether borrowers discipline bank risk-taking. This new hypothesis points out that low-quality banks issue fewer loans and charge lower interests rates. Contrary to the general view, our findings suggest weak presence of market discipline. These results are robust to different indicators of the key explanatory variables and econometric methods. For policymakers, this implies a necessity to restore market discipline following the Basel Accord.

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## 1. Introduction

During the 1990s and 2000s most of the empirical literature found evidence in favor of the presence of market discipline in the banking sector, particularly in developed countries (Flannery, 1998; Flannery and Nikolova, 2004). This evidence supports the recommendations of the Basel Committee, specifically the Third Pillar in Basel III on disclosure policy to provide adequate information about bank risk to private economic agents, who, through market forces, can penalize banks for excessive risk taking. As a result, banks would moderate their risky behavior (Ayadi, 2013; Basel Committee on Banking Supervision, 2011, 2006).

Since 2007, banking crises and bank bailouts in the USA and Europe have generated a new wave of research on market discipline (Belkhir, 2013; Ben-David et al., in press; Berger and Turk-Ariss, 2014; Beyhaghi et al., 2013; Dumontaux and Pop, 2013; Hasan et al., 2014; Nguyen, 2013; Tovar-García, 2016a,b, 2014). Arguably, because of a tradeoff between safety nets and market discipline (Demirgüç-Kunt and Huizinga, 2004), neither regulators nor market agents were able to prevent the recent failure of

large banks, making visible the implicit policies of too-big-to-fail, too-important-to-fail, too-interconnected-to-fail, and suggesting a future where banks may be too-big-to-save (Balasubramanian and Cyree, 2014; Demirgüç-Kunt and Huizinga, 2013). It is still not clear if market discipline exists, under which conditions, and if it has been tested correctly, in particular, if internal capital markets were not taken into account (Ben-David et al., in press). Nevertheless, market discipline is still considered a key instrument to achieve financial stability, and a complement to regulatory discipline, as the new Basel Accord points out.

From the 1980s to the first years of the 2000s several banking crises considerably affected Latin American economies. Consequently, the Latin American banking systems are following the Basel recommendations (since 2009 Argentina, Brazil, and Mexico are members of the Basel Committee), and have been receiving important investments from foreign banks, in a merger and acquisition process, particularly from Spain, the USA, and United Kingdom, resulting in a process of growth of the industry, but with bank concentration (CEPAL, 2012). Under these conditions, this research is motivated by the following question: does market discipline exist in the Latin American banking system?

In general, there are mixed results about the presence of discipline induced by depositors in Latin American countries (Tovar-García, 2014). During the 1980s and 1990s, Martínez-Peria

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and Schmukler (2001) found evidence of depositor discipline in Argentina, Chile, and Mexico. This evidence is stronger in the post-crisis period, and despite implicit deposit insurance schemes, indicating that depositors do not trust government involvement. On the contrary, Tovar-García (2014) found weak evidence of market discipline in Mexico during the period 2008–2012. In spite of the explicit deposit insurance system, which should motivate monitoring activities by private agents. Moreover, banks' internal capital demand appears to influence interest rates on deposits and their growth rates, suggesting that previous results could be biased.

While numerous studies have been carried out on the liability side of market discipline, induced by creditors of the bank, the asset side market discipline effect has been little studied (Allen et al., 2011; Kim et al., 2005; Tovar-García, 2012; Tovar-García and Kozubekova, 2016). Borrowers can also monitor bank risk taking, because they prefer banks with high capital ratios and asset quality (quality of bank loans). In Mexico, Tovar-García (2012) found evidence in favor of this hypothesis, but the seven largest banks controlling around 80% of the market can elude this kind of discipline.

This article studies the discipline induced by depositors (testing four hypotheses H1–H4) and borrowers (testing other four hypotheses H5–H8) using panel data from 95 banks in 12 Latin American countries during the years 2008–2012. Under the conditions of the global financial crisis, which should motivate the monitoring activities of the banking economic agents (Martinez-Peria and Schmukler, 2001). Our contributions to the literature are threefold. First, we reevaluate the traditional tests of market discipline under the current conditions of the Latin American banking system, where most of the countries have limited deposit insurance schemes. Second, we test market discipline from the asset side, which has been little studied. Third, we test the internal capital market hypothesis, which allows to control the demand effect on deposit rates (and deposit growth), and the supply effect on loan rates (and loan growth), which have been forgotten in the empirical literature.

We use dynamic panel models and the SYS GMM estimator (Blundell and Bond, 1998). Contrary to previous findings, interest rates on deposits and loans, and their growth rates, are determined principally by macroeconomic conditions and weakly by bank fundamentals. These results hold after a number of robustness tests with different indicators of bank fundamentals, and fixed and random effects regression models.

The paper proceeds as follows. Section 2 presents the framework and the working hypotheses. Section 3 describes the data and variables used in this study. Section 4 outlines the empirical strategy and presents the results. Section 5 concludes.

## 2. Theoretical framework and hypotheses development

Market discipline is a mechanism where private economic agents (including borrowers) make market decisions to penalize banks because of their excessive risk taking. There is an inverse relationship between bank risk and the wellbeing of creditors and debtors of banks. As a result, the bank should modify its risky behavior. We assume that these private economic agents have the ability to monitor banks and the capability to influence bank actions (Flannery, 2001).<sup>1</sup> Note that small economic agents, in particular small depositors, usually with low levels of financial education and with incentives for free-rider behavior do not care about bank fundamentals to make decisions, but the market share of this kind

<sup>1</sup> The empirical literature is centered around tests for market monitoring. The market influence usually is omitted in the empirical research due to data limitations and endogeneity concerns.

of agents is typically small. On the contrary, the largest economic agents, well educated, can interpret and respond to banking indicators (Márquez, 2011).

The well known model of supply and demand is useful to understand the concept of market discipline. A depositor (supply side) will find the excessive risk taking of his/her bank as a situation that increases his/her costs. As a result, the depositor will require a higher interest rate on his/her deposits and/or he/she will withdraw his/her resources. That is, the supply curve of deposits shifts leftward. Borrowers should demonstrate a similar behavior shifting the demand curve of loans.

Thus, to answer whether market discipline exist in Latin America, this research examines two markets: the market of deposits and the market of loans (testing depositor discipline and borrower discipline). For this purpose, up to eight hypotheses are tested. H1 and H2 are traditional tests of depositor discipline and H3 and H4 extend these standard tests controlling for demand-side effects (the internal capital market hypothesis). Similarly, H5 and H6 are standard tests of borrower discipline and H7 and H8 extend these tests controlling for supply-side effects (internal capital markets). See Fig. 1.

### 2.1. Depositor discipline

Traditional tests for the existence of discipline induced by depositors verify the following hypotheses:

**H1.** Bank risk is positively related to interest rates on deposits (price-based mechanism of market discipline).

**H2.** Bank risk is negatively related to deposit growth (quantity-based mechanism of market discipline).<sup>2</sup>

In the second traditional test (H2), note the use of deposit growth instead of the absolute amount, to avoid biases from bank characteristics as size and business orientation (Hasan et al., 2013; Tovar-García, 2014).

Most of the empirical literature has forgotten that the demand side forces (bank's internal capital market) can determine the interest rates on deposits (and the growth of deposit volumes). Since less risky banks (i.e., banks with more solvency) are more solid, they can pay higher interest rates in order to damage their competitors. In other words, the higher interest rate may be a result of a shift of the demand curve to the right (or the smaller quantity of deposits may be a result of a shift of the demand curve to the left).

Ben-David et al. (in press) point out that loan growth is a key variable to approach the demand side effect on deposit rates. As a result of an increase in the demand for loans (loan growth), the bank will look for more deposits, and one way to attract them is to offer higher interest rates. Analogously, a reduction in the demand for loans will cause a reduction in the demand for deposits, and vice versa. To test this demand side effect on deposits the following hypotheses are verified:

**H3.** Bank loan growth has a positive effect on deposit rates (price-based mechanism of market discipline).

**H4.** Bank loan growth has a positive effect on deposit growth (quantity-based mechanism of market discipline).

Ben-David et al. (in press) did not find evidence of discipline induced by depositors in the USA. In their empirical tests, capital ratios (as a key indicator of bank risk) do not determine interest rates on deposits. On the contrary, loan growth (a key indicator

<sup>2</sup> In the literature is possible to find a third discipline mechanism: maturity-based (Goday et al., 2005; Tovar-García, 2014). Due to data limitations, we do not test this third mechanism.

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